LAST WEEK

• Input, Output, Processor, Memory
• Bits are 0 and 1
• Koans:
  • Koan 1: Everything is bits
  • Koan 2: Perfect copy, every time
  • Koan 3: There is want in the midst of plenty
  • Koan 4: Processing is power
  • Koan 5: More of the same can be different
  • Koan 6: Cyberworld’s everlasting memory
  • Koan 7: Speed of (mis?)information
TODAY

• What is the Internet?
• What is the Web?
• Internet vs. the Web
• History of the Internet
• History of the Web
WHAT DOES A WEB BROWSER DO?
WHAT IS THE INTERNET?

A system of interconnected computer networks that link together billion of devices using the TCP/IP communication protocols.
CLIENTS AND SERVERS

Client sends a request

Server sends a reply
**EXAMPLE: FILE TRANSFER**

Client: You and your Fetch application.

Server: cs.wellesley.edu

Request #1: Here is a file to save in my cs server account.
Response #1: Got it.

Request #2: Download my hw1 folder from my cs account.
Response #2: Here it is.
**EXAMPLE: WWW**

*Client:* You and your web browser.

*Server:* cs.wellesley.edu

```
Request: Show me the schedule page.
Response: Here you go.
```

<table>
<thead>
<tr>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAN 29</td>
<td>JAN 30</td>
<td>JAN 31</td>
<td>FEB 01</td>
<td>FEB 02</td>
</tr>
<tr>
<td>Welcome, Logistics</td>
<td>Lab 1-1: Basics</td>
<td>Digital footprints</td>
<td>Weekly reflection due at noon</td>
<td>Weekly reflection</td>
</tr>
<tr>
<td>Read: Course Web Page</td>
<td>Lab 1-2: HTML</td>
<td>Read: BITS 1: Digital Explosion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quiz: Entry Questionnaire</td>
<td>Read: HTML Coding</td>
<td></td>
<td></td>
<td>Sign-up for one-on-one</td>
</tr>
<tr>
<td>FEB 05</td>
<td>FEB 06</td>
<td>FEB 07</td>
<td>FEB 08</td>
<td>FEB 09</td>
</tr>
<tr>
<td>History of the Web</td>
<td>Lab 2-1: HTML and URLs</td>
<td>The Social Web</td>
<td>The Social Web</td>
<td>Weekly reflection</td>
</tr>
<tr>
<td>Read: History Notes, TBL Ch 1-2</td>
<td>Lab 2-2: Image manipulations</td>
<td>Intro to teamwork</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video: Memex &amp; Tim Berners-Lee</td>
<td>Read: URLs</td>
<td>Read: Web 2.0 (read sections 2, 3, 8 in detail; skim the rest)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assign1: personal website in HTML due at 11:59pm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Please note that READINGS are due on the day they appear. Check this page frequently, as it is subject to change.*
WWW = WORLD WIDE WEB

Tim Berners-Lee is the inventor of the WWW (1989), an application that runs on the Internet.

He created:
- URLs,
- the HTTP protocol,
- the HTML language

He didn’t patent his technology, he put it on the Internet for free, so that other people could build upon it.
INTERNET VS. WWW

The Internet is the *physical* network of computers all over the world.

The World Wide Web is a *virtual* network of websites connected by hyperlinks (or links).

The Web is only one of the many applications that run on the Internet.

The Web uses the HTTP (Hyper Text Transfer Protocol) to allow clients and servers to communicate.

A client: Chrome, Safari, Firefox, Explorer.

Servers: nytimes.com, facebook.com, cs.wellesley.edu
HTTP, URL, HTML

The three components that allowed Tim Berners-Lee to create the Web

URL: The unique name of every document

HTML: A simple language for documents

HTTP: How to request and receive any document
WHAT IS A URL?

URL = Universal Resource Locator
Specifies the location of a web resource (web page, image, sound file, movie, etc.) in a remote server on the Internet.
Also known as a web address.

http://cs.wellesley.edu/~cs115/notes/simple.html

protocol  domain name  path  file
host  server
HTML – LANGUAGE OF WEB PAGES

HTML = HyperText Markup Language

```html
<html>
<body>

<h1>CS115</h1>

<p>Simple Web page</p>
<ul>
  <li>What is the Internet?</li>
  <li>What is the Web?</li>
</ul>

</body>
</html>
```
WEB BROWSERS RENDER HTML

CS115

Simple Web page

- What is the Internet?
- What is the Web?
"VIEW SOURCE" SHOWS UNDERLYING HTML

```html
<!DOCTYPE html>
<html lang="en">
<head>
    <!-- Basic Page Needs -->
    <meta charset="utf-8">
    <!--[if IE]><meta http-equiv="x-ua-compatible" content="IE=9" /></![endif]-->
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <title>CS115/MAS115: Computing for the Socio-Techno Web</title>

    <!-- Favicons -->
    <link rel="shortcut icon" href="img/favicon.ico" type="image/x-icon">
    <link rel="apple-touch-icon" href="img/apple-touch-icon.png">
    <link rel="apple-touch-icon" sizes="72x72" href="img/apple-touch-icon-72x72.png">
    <link rel="apple-touch-icon" sizes="114x114" href="img/apple-touch-icon-114x114.png">

    <!-- Bootstrap -->
    <link rel="stylesheet" type="text/css" href="css/bootstrap.css">
    <link rel="stylesheet" type="text/css" href="fonts/font-awesome/css/font-awesome.css">

    <!-- Slider -->
    <link href="css/owl.carousel.css" rel="stylesheet" media="screen">
    <link href="css/owl.theme.css" rel="stylesheet" media="screen">
</head>
```
HTTP = HYPERTEXT TRANSFER PROTOCOL

A PC with an Internet Explorer

A Mac with Safari
AN HTTP RESPONSE

HTTP/1.1 200 OK
Date: Thu, 12 Nov 2015 09:59:17 GMT
Server: Apache/2.2.15 (Red Hat)
Last-Modified: Thu, 12 Nov 2015 09:46:59 GMT
ETag: "ccb62f-1f1-52454d2fc112a"
Content-Length: 497
Content-Type: text/html; charset=UTF-8

<!DOCTYPE html>
<html lang="">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title></title>
</head>

<body>
  <h1>Welcome to CS115!</h1>
  <h2>Learn about Web APIs</h2>
  ...
</body>
BRIEF HISTORY OF THE INTERNET

1968 - DARPA (Defense Advanced Research Projects Agency) contracts with BBN (Bolt, Beranek & Newman) to create ARPAnet

1970 - First five nodes:
- UCLA
- Stanford
- UC Santa Barbara
- U of Utah, and
- BBN

1974 - TCP specification by Vint Cerf

1984 – On January 1, the Internet with its 1000 hosts converts en masse to using TCP/IP for its messaging
Submarine cables that make the Internet possible – Jan 2017
HISTORY OF THE WEB 1/2

1945
Vannevar Bush: publishes seminal article “As We May Think”

1960s
Doug Engelbart prototypes an "oNLine System" (NLS) which does hypertext browsing editing, email, and so on. He invents the mouse for this purpose.
Ted Nelson coins the word Hypertext in A File Structure for the Complex, the Changing, and the Indeterminate. 20th National Conference,

1980
TBL writes a notebook program, "Enquire", which allows links to be made between arbitrary nodes.

1989
"Information Management: A Proposal" written by TBL circulated at CERN
1990
TBL writes a global hypertext system. He names it "World Wide Web"
TBL presented poster at [Hypertext'91](#) in San Antonio, Texas (US).

1993
Commercial use of the Internet becomes allowed.
CERN declares that WWW technology would be freely usable by anyone
NCSA releases working versions of Mosaic browser for all common
platforms: X, PC/Windows and Macintosh.

1994
[First International WWW Conference](#), CERN, Geneva. Heavily
oversubscribed (800 apply, 400 allowed in): the "Woodstock of the Web".
A scientist of the future records experiments with a tiny camera fitted with universal-focus lens. The small square in the eyeglass at the left sights the object (LIFE 19(11), p. 112).
ANIMATION OF THE MEMEX

From Vannevar Bush’s Essay As We May Think
...BUT HE DID NOT CALL IT “HYPERTEXT”...

Term coined by Ted Nelson [1965]
Xanadu: Far more powerful than the Web
  • Distributed network of documents
  • Two-way hyperlinks
  • Version management
  • Annotation
  • Elaborate copyright management system
  • Innovative (micro) payment system

But it did not succeed!
  • Why did it fail?
THE CREATION OF THE WEB

Tim Berners-Lee implements his childhood Enquire “2.0”
Why did it take off?
A POSTER AT
HYPERTEXT’91
WEB – DESIGN PRINCIPLES

- Decentralization
- Non-discrimination
- Bottom-up design
- Universality
- Consensus
TO DO

• Lab tomorrow
• Assignment 1 due Thursday
• No office hours this week, individual meetings instead